

Highs.—Three of the high areas began off the north Pacific coast. Nos. IV and VI were first noted in Manitoba and No. II was first seen in Wyoming. The general direction was toward the east or south of east. Nos. III and VI passed off the Nova Scotia coast, Nos. I and IV were last noted off the middle Atlantic coast, and Nos. II and V disappeared off the south Atlantic coast.

Lows.—Of the lows, Nos. I, II, III, IV, and IX were first noted to the north of Montana, Nos. VI and VII in Idaho, No. V in Arizona, and No. VIII in Kansas. The general direction was east or north of east. No. I was last noted in Manitoba, No. VI in Oklahoma, No. VII in Ontario, and the remaining six were last seen in Nova Scotia or the Gulf of St. Lawrence. The following high winds were reported in connection with these storms. On the evening of the 2d, as the last storm of April passed into the Atlantic, New York reported a northwest wind of 56 miles an hour. On the evening of the 12th, as low No. IV reached the upper Lakes, Marquette reported a south wind of 42 miles. On the evening of the 16th, as low No. V approached the Lake regions, Buffalo reported a west wind of 60 miles. As low No. VII approached the upper Lakes Chicago experienced a south wind of 56 miles. On the a. m. of the 29th, as low No. VIII approached the upper Lakes Chicago reported a southwest wind of 52 miles.—*H. A. Hazen.*

RIVERS AND FLOODS.

River conditions during the month of May were devoid of general interest. The Mississippi, below Helena, Ark., was still above danger line at the beginning of the month, but was falling steadily, and on the 10th fell below the danger line at New Orleans. The Atchafalaya remained above the danger line until the 24th, and fell slightly thereafter.

From the 7th to the 13th there was a moderate flood in the Arkansas River from the Indian Territory eastward, due to excessive rains over this portion of the river basin, Webbers Falls, Ind. T., reported a stage of 24.8 feet on the 8th, or 1.8 above danger line. The danger line of 22 feet was passed at Fort Smith on the 8th, and a maximum stage of 26.4 feet reached on the 9th. Warnings that bottom lands would be overflowed were issued on the 6th, and were fully verified.

At Little Rock the danger stage of 23 feet was reached on the 9th, and a maximum stage of 24.5 feet attained on the 11th, the waters remaining above the danger line until the 13th. A special warning for a 25-foot stage at Little Rock was issued on the 8th, and given the widest possible distribution. Levees were strengthened, and stock and other portable property removed to higher ground.

Considerable damage was done to some of the more exposed farming lands, and backwater inundated a few plantations. Below Little Rock between 5,000 and 6,000 acres of bottom lands were submerged, and 1,000 acres above.

On the Pacific coast the annual rise of the Columbia began about the middle of the month, but nothing of consequence had resulted by the end of the month.

The highest and lowest water, mean stage, and monthly range at 127 river stations are given in the accompanying table. Hydrographs for typical points on seven principal rivers are shown on the accompanying chart. The stations selected for charting are: Keokuk, St. Louis, Cairo, Memphis, Vicksburg, and New Orleans on the Mississippi; Cincinnati, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankfeldt, Forecast Official.*

Heights of rivers referred to zeros of gages, May, 1899.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Mississippi River.</i>								
St. Paul, Minn.	1,957	14	7.6	8	5.7	27, 30, 31	6.4	1.9
Reads Landing, Minn.	1,887	12	7.1	8	5.0	18, 19, 28	5.9	2.1
La Crosse, Wis.	1,822	12	8.8	8-10	6.9	20	7.8	1.9
North McGregor, Iowa.	1,762	18	10.8	12	7.8	23-25	9.3	3.0
Dubuque, Iowa.	1,703	15	11.2	1	7.8	25, 27	9.6	3.4
Leolaire, Iowa.	1,612	10	7.5	2	5.2	26	6.6	2.2
Davenport, Iowa.	1,596	15	9.6	2	6.4	26, 27	8.3	3.2
Muscatine, Iowa.	1,565	16	11.2	3	7.9	27	9.9	3.3
Galland, Iowa.	1,475	8	6.1	22	4.4	27-29	5.2	1.7
Keokuk, Iowa.	1,466	14	12.4	22	7.8	28	9.4	4.4
Hannibal, Mo.	1,405	17	15.0	23	9.7	14, 15	11.4	5.3
Grafton, Ill.	1,307	23	18.3	25	12.0	16	14.6	6.8
St. Louis, Mo.	1,264	30	25.1	1	17.9	20	20.4	7.2
Chester, Ill.	1,189	36	20.9	2	15.0	21	17.9	5.9
Memphis, Tenn.	943	33	26.3	2	20.5	12	22.8	5.8
Helena, Ark.	787	42	37.1	1-3	29.8	18, 14	33.4	7.3
Arkansas City, Ark.	635	42	44.1	1	37.6	31	40.1	6.5
Greenville, Miss.	595	42	38.4	1	31.9	31	34.5	6.5
Vicksburg, Miss.	474	45	45.6	1	37.4	31	40.9	8.2
New Orleans, La.	108	16	16.6	1	13.6	30, 31	15.7	3.0
<i>Missouri River.</i>								
Bismarck, N. Dak.	1,201	14	9.1	26	4.8	7	6.2	4.3
Pierre, S. Dak.	1,006	14	9.8	26	5.7	12	6.9	3.6
Sioux City, Iowa.	676	19	12.4	31	8.8	15, 21, 22	10.2	3.6
Omaha, Nebr.	561	18	12.4	31	9.4	16	10.7	3.0
Plattsmouth, Nebr.	533	17	8.9	31	6.3	17, 19, 23, 24	7.2	2.6
St. Joseph, Mo.	373	10	8.7	1	6.5	18, 19	7.6	2.2
Kansas City, Mo.	280	21	18.6	1	13.2	19	15.9	5.4
Boonville, Mo.	191	20	19.7	1	11.7	18, 19	14.2	8.0
Hermann, Mo.	95	34	18.4	1	12.1	21	14.7	6.3
<i>Des Moines River.</i>								
Des Moines, Iowa.	150	19	7.4	31	3.8	28-28	4.5	3.6
<i>Illinois River.</i>								
Peoria, Ill.	135	14	8.7	1	6.7	14-16	7.5	2.0
Beardstown, Ill.	70	13	11.9	30	8.5	19, 20	9.7	3.4
<i>Osage River.</i>								
Bagnell, Mo.	70	28	18.0	12	3.9	24	6.6	14.1
<i>Gasconade River.</i>								
Arlington, Mo.	58	16	8.3	12	-0.1	31	2.2	8.4
<i>Youghiogheny River.</i>								
Confidence, Pa.	59	10	9.5	15	2.0	1, 29	3.6	7.5
West Newton, Pa.	15	23	12.1	19	1.1	2	2.8	11.0
<i>Allegheny River.</i>								
Warren, Pa.	177	7	3.0	4	1.2	16, 17	1.8	1.8
Oil City, Pa.	123	13	5.0	18	1.6	16	2.6	3.4
Parkers Landing, Pa.	73	20	6.5	19	1.3	15, 16	2.8	5.2
<i>Monongahela River.</i>								
Weston, W. Va.	161	18	2.4	12	-0.8	28, 29	0.4	3.2
Fairmont, W. Va.	119	25	8.8	18	0.6	29-31	2.7	3.2
Greensboro, Pa.	81	18	14.9	19	7.0	29-31	9.1	7.9
Lock No. 4, Pa.	40	28	19.5	19	7.0	31	9.8	12.5
<i>Conemaugh River.</i>								
Johnstown, Pa.	64	7	8.7	18	1.5	2	2.3	7.2
<i>Red Bank Creek.</i>								
Brookville, Pa.	35	8	3.5	18	0.5	16	1.0	3.0
<i>Beaver River.</i>								
Ellwood Junction, Pa.	10	14	7.3	18	0.6	13-16	1.2	6.7
<i>Great Kanawha River.</i>								
Charleston, W. Va.	61	30	16.5	10	5.0	22, 23	7.5	11.6
<i>New River.</i>								
Hinton, W. Va.	95	14	6.2	9	2.1	29	3.4	4.1
<i>Cheat River.</i>								
Rowlesburg, W. Va.	36	14	7.5	18	2.0	29-31	3.5	5.5
<i>Ohio River.</i>								
Pittsburg, Pa.	966	22	18.1	19	2.9	2	5.7	15.2
Davis Island Dam, Pa.	960	25	17.0	19	4.7	29	7.1	12.3
Wheeling, W. Va.	873	36	22.6	20	5.8	4, 29	8.5	16.8
Parkersburg, W. Va.	785	36	20.0	21	7.0	28, 29	9.3	18.0
Point Pleasant, W. Va.	703	39	20.6	22	5.8	30	10.9	14.8
Catlettsburg, Ky.	651	50	23.8	22	8.2	30	14.6	15.6
Portsmouth, Ohio	612	50	23.1	23	9.2	31	15.4	13.9
Cincinnati, Ohio	499	50	24.0	24	11.7	31	17.4	12.3
Louisville, Ky.	367	28	9.6	14	6.4	31	7.9	3.2
Evansville, Ind.	194	35	22.7	16	11.8	4	15.7	10.9
Paducah, Ky.	47	40	24.1	17	14.8	10	18.9	9.3
Cairo, Ill.	1,073	45	34.1	1	26.4	10	30.4	7.7
<i>Muskingum River.</i>								
Zanesville, Ohio.	70	30	12.5	30	6.4	16	7.5	6.1
<i>Miami River.</i>								
Dayton, Ohio.	69	18	2.2	8	1.8	26, 28, 29	1.7	0.9
<i>Wabash River.</i>								
Mount Carmel, Ill.	50	15	7.0	17	3.2	31	5.0	8.8
<i>Licking River.</i>								
Falmouth, Ky.	30	25	6.4	14	1.4	29-31	3.3	5.0
<i>Clinch River.</i>								
Spears Ferry, Va.	156	20	6.7	14	0.4	29	2.2	6.3
Clinton, Tenn.	46	25	15.0	9	4.6	29, 30	8.2	10.4
<i>Tennessee River.</i>								
Knoxville, Tenn.	614	28	4.8	9	0.6	30, 30	2.2	4.2
Kingsport, Tenn.	534	25	8.1	10	2.2	29	4.2	5.9
Chattanooga, Tenn.	430	33	11.2	11	4.2	30	7.2	7.0
Bridgeport, Ala.	390	24	8.5	11, 12	2.5	30, 31	5.2	6.0
Florence, Ala.	320	16	7.4	13	2.4	31	5.0	5.0
Riverton, Ala.	190	25	9.6	14	2.5	31	6.3	7.1
Johnsonville, Tenn.	94	21	12.3	1	4.1	31	7.9	8.2
<i>Cumberland River.</i>								
Burnside, Ky.	434	50	35.0	8	2.4	30	9.2	32.6
Carthage, Tenn.	257	30	25.9	11	2.7	31	10.0	23.2
Nashville, Tenn.	175	40	29.4	13	4.3	31	13.8	25.1
<i>Arkansas River.</i>								
Wichita, Kans.	720	10	2.6	24	1.3	19	1.8	1.3
Webbers Falls, Ind. T.	407	33	24.8	8	5.6	3	11.7	19.2

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Arkansas River—Con.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
Fort Smith, Ark.	845	22	26.4	9	6.5	4	13.6	19.9
Dardanelle, Ark.	250	21	23.5	10	7.4	5	13.3	16.1
Little Rock, Ark.	170	23	24.5	11	9.4	5	15.6	15.1
<i>White River.</i>								
Newport, Ark.	150	26	28.0	13	12.2	31	19.1	15.8
<i>Yazoo River.</i>								
Yazoo City, Miss.	80	25	23.1	1	12.0	31	16.7	11.1
<i>Red River.</i>								
Arthur City, Tex.	688	27	14.8	15	4.9	7	9.4	9.9
Fulton, Ark.	505	28	21.5	17	8.0	5	13.0	13.5
Shreveport, La.	449	29	12.6	19, 20	8.0	8	10.3	4.6
Alexandria, La.	139	33	12.9	23	7.8	1	10.7	5.1
<i>Ouachita River.</i>								
Camden, Ark.	340	39	26.9	31	9.3	5	19.1	17.6
Monroe, La.	100	40	21.2	24, 25	20.0	14-18	20.7	1.2
<i>Atchafalaya Bayou.</i>								
Melville, La.	100+	31	33.4	1	30.6	31	32.0	2.8
<i>Susquehanna River.</i>								
Wilkesbarre, Pa.	178	14	2.2	1	0.0	(10-19) (23-31) (16, 17) (20-31)	0.6	2.2
Harrisburg, Pa.	70	17	5.2	21	2.5	(16, 17) (20-31)	3.1	2.7
<i>W. Br. of Susquehanna.</i>								
Williamsport, Pa.	35	20	7.3	20	2.0	17	3.1	5.3
<i>Juniata River.</i>								
Huntingdon, Pa.	80	24						
<i>Potomac River.</i>								
Harpers Ferry, W. Va.	170	16	9.0	19	2.3	2	3.5	6.7
<i>James River.</i>								
Lynchburg, Va.	257	18	5.1	10	1.0	29-31	2.0	4.1
Richmond, Va.	110	12	2.8	11	0.3	28	1.0	2.5
<i>Roanoke River.</i>								
Clarksville, Va.	155	12	4.9	31	2.2	29	3.0	2.7
Weldon, N. C.	90	27	11.4	18	7.8	20, 30	8.8	3.6
<i>Cape Fear River.</i>								
Fayetteville, N. C.	100	38	17.3	15	4.2	29, 30	7.7	13.1
<i>Lumber River.</i>								
Fairbluff, N. C.	10	6	4.7	1	2.8	31	3.8	1.9
<i>Edisto River.</i>								
Edisto, S. C.	75	6	4.0	1-3	2.5	22-26	3.1	1.5
<i>Pedee River.</i>								
Cheraw, S. C.	145	27	13.0	15	2.5	28, 29	5.0	10.5
<i>Black River.</i>								
Kingstree, S. C.	60	12	5.8	1	1.7	23-31	3.4	4.1

Heights of rivers referred to zeros of gages—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
<i>Lynch Creek.</i>	<i>Miles.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>	<i>Feet.</i>
Effingham, S. C.	35	12	6.6	1-3	3.2	31	4.5	3.4
<i>Santee River.</i>								
St. Stephens, S. C.	50	12	7.9	1	4.3	31	6.7	3.6
<i>Congaree River.</i>								
Columbia, S. C.	37	15	1.4	8	0.4	21	0.9	1.0
<i>Watauga River.</i>								
Camden, S. C.	45	24	12.1	15	4.4	6	7.1	7.7
<i>Waccamaw River.</i>								
Conway, S. C.	40	7	6.3	9	2.8	31	4.7	3.5
<i>Savannah River.</i>								
Calhoun Falls, S. C.			4.0	1, 7	3.1	30	3.6	0.9
Augusta, Ga.	130	32	10.4	8	7.3	31	8.6	3.1
<i>Broad River.</i>								
Carlton, Ga.			3.2	5-7	2.5	29, 30	2.8	0.7
<i>Flint River.</i>								
Albany, Ga.	80	20	5.4	1, 27	0.9	20-22	2.9	4.5
<i>Chatahochee River.</i>								
West Point, Ga.	239	20	4.8	24	3.0	22, 23	3.7	1.8
Eufaula, Ala.	90	30						
<i>Coosa River.</i>								
Rome, Ga.	225	30	4.0	1	2.0	20, 30	3.1	2.0
Gadsden, Ala.	144	18	5.4	1	1.4	29	3.1	4.0
<i>Alabama River.</i>								
Montgomery, Ala.	265	35	9.8	1	3.0	31	5.2	6.8
Selma, Ala.	212	35	13.9	1	4.2	31	7	9.7
<i>Tombigbee River.</i>								
Columbus, Miss.	285	33	0.4	1	-1.4	31	-0.6	1.8
Demopolis, Ala.	155	35	7.1	3	1.8	31	3.9	5.3
<i>Black Warrior River.</i>								
Tuscaloosa, Ala.	90	38	7.9	1	1.5	29	4.1	6.4
<i>Columbia River.</i>								
Umatilla, Oreg.	270	25	17.1	31	7.8	6	12.2	9.3
The Dalles, Oreg.	166	40	23.4	31	12.4	7	19.4	16.0
<i>Willamette River.</i>								
Albany, Oreg.	99	20	8.4	2	5.2	18, 22	6.7	3.2
Portland, Oreg.	10	15	16.8	31	8.1	7	11.5	8.7
<i>Sacramento River.</i>								
Red Bluff, Cal.	241	23	4.8	1, 2	0.9	30	2.3	3.9
Sacramento, Cal.	70	25	20.0	1	15.2	31	17.3	4.8

¹Record for 29 days.

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

Alabama.—The mean temperature was 75.9°, or 4.8° above normal; the highest was 100°, at Elba on the 18th, and the lowest, 48°, at Hamilton on the 19th. The average precipitation was 2.03, or 1.86 below normal; the greatest monthly amount, 4.80, occurred at Marion, and the least, 0.06, at Thomasville.—*F. P. Chaffee.*

Arizona.—The mean temperature was 65.8°, or 5.9° below normal; the highest was 106°, at Fort Mohave and Parker on the 12th, and the lowest, 5°, at Prescott on the 3d. The average precipitation was trace, or 0.16 below normal; the greatest monthly amount, 0.10, occurred at Holbrook, while none fell at many stations.—*W. G. Burns.*

Arkansas.—The mean temperature was 72.9°, or 3.0° above normal; the highest was 96°, at Jonesboro on the 15th, and the lowest, 44°, at Pond on the 5th. The average precipitation was 6.45, or 1.97 above normal; the greatest monthly amount, 13.36, occurred at Moore, and the least, 2.37, at Canton.—*E. B. Richards.*

California.—The mean temperature for the State, obtained by weighting the reports from 281 stations, so that equal areas have about the same weight, was 59.9°, or 4.3° below the May normal for the State, as determined from 198 records; the highest was 110°, at Volcano Springs, San Diego County, on the 13th, and the lowest, 13°, at Bodie, Mono County, on the 1st and 30th. The average precipitation for the State, as determined by the records of 298 stations, was 0.73; the deficiency, as indicated by reports from 160 stations which have normals, was 0.23 the greatest monthly amount was 4.80, at Bowman's Dam, Nevada County, while none fell at several stations.—*Alexander G. McAdie.*

Colorado.—The mean temperature was 52.2°, or 1.6° below normal; the highest was 100°, at Fort Morgan on the 25th, and the lowest, 3°, at Wagon Wheel Gap on the 3d. The average precipitation was 0.62, or

1.71 below normal; the greatest monthly amount, 2.93, occurred at Le Roy, while none fell at Perry Park and Rangely.—*F. H. Brandenburg.*

Florida.—The mean temperature was 78.5°, or 2.9° above normal; the highest was 101°, at Archer on the 18th, and the lowest, 52°, at Wausau on the 1st. The average precipitation was 1.22, or about 2.80 below normal; the greatest monthly amount, 4.03, occurred at McClenny, and the least, 0.13, at Tarpon Springs.—*A. J. Mitchell.*

Georgia.—The mean temperature was 75.2°, or 3.6° above normal; the highest was 101°, at Fleming on the 21st and 22d, and the lowest, 41°, at Diamond on the 10th. The average precipitation was 1.76, or 1.36 below normal; the greatest monthly amount, 5.44, occurred at Mauzy, and the least, 0.54, at Morgan.—*J. B. Marbury.*

Idaho.—The mean temperature was 48.4°, or 4.2° below normal; the highest was 88°, at Hagerman on the 23d, and the lowest, 6°, at Lake on the 2d and at Marysville on the 3d. The average precipitation was 1.60, or 0.49 below normal; the greatest monthly amount, 3.50, occurred at Kootenai, and the least, 0.35, at Burnside.—*S. M. Blundford.*

Illinois.—The mean temperature was 64.0°, or 1.3° above normal; the highest was 93°, at New Burnside on the 15th and at Equality on the 26th, and the lowest, 33°, at Lanark on the 21st. The average precipitation was 6.06, or 1.81 above normal; the greatest monthly amount, 13.10, occurred at Griggsville, where 5.33 fell in the storm of the 28th; the least amount, 1.84, occurred at Chester.—*C. E. Linney.*

Indiana.—The mean temperature was 64.4°, or 2.4° above normal; the highest was 96°, at Washington on the 4th, and the lowest, 36°, at Delphi on the 5th. The average precipitation was 3.95, or 0.22 below normal; the greatest monthly amount, 8.15, occurred at Vevay, and the least, 1.85, at Princeton.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature was 60.2°, or slightly above normal; the highest was 90°, at Desoto on the 26th, and the lowest, 27°, at Larabee and Spencer on the 13th. The average precipitation was 6.23, or about 2.00 above normal; the greatest monthly amount, 11.47, occurred at Keokuk, and the least, 3.09, at Ridgeway.—*J. R. Sage, Director; G. M. Chappel, Assistant.*

Kansas.—The mean temperature was 67.4°, or 3.0° above normal; the highest was 105°, at Eureka Ranch on the 14th, and the lowest, 24°,